

## REMARKS

### *General:*

Claims 1-26 were pending in the application. Claims 1-26 stand rejected. Claims 1, 4, 6, 7, 9, 14, 17, 19, and 20 are amended in this response. Claims 13 and 26 are canceled. Claims 27 and 28 are new. Claims 1-12, 14-25, 27, and 28 are pending after this amendment.

### *35 U.S.C. § 102 rejections:*

Claims 1-2, 7-15, and 20-26 are rejected as anticipated by U.S. Patent No. 5,547,546 (Prough et al.) Prough shows a chip bin 10 in which chips are added through an air lock 10 at the top and removed through a chip meter 12 at the bottom. The chip bin 10 is filled with "a column of comminuted cellulose material," col. 3, lines 31-32, to a certain level. The level must be within the height range covered by the level detector 26, see for example col. 5, lines 31-35 and col. 6, lines 61-65. The level must also be at least 5 feet above the bottom of the temperature sensor 41, see col. 6, lines 54-57. The chip bin 10 is provided with "a conventional header" 22 for steam generated from black liquor in flash tank 16. The steam header 22 is below the level detector 26, and below the temperature sensor 41. The steam flow rate is regulated so that the steam condenses about 5 feet below the surface of the column of chips, see col. 6, lines 53-54. "Steam is also added through the conventional supporting arms and vibrating cones via conduit 28" at the bottom of the chip bin. Col. 5, lines 5-6.

Claims 1 and 14 are directed to a chip bin with steam orifices arranged to strike chips falling through the upper part of the chip bin, that is to say, above the top of the column of residing chips, with steam. The examiner argues variously that the "upper part" can be interpreted to include the part of Prough's chip bin with the steam orifices 22, and that claim 1 does not require the steam orifices to be in the upper part. The applicant does not agree with the examiner's interpretation of claim 1, but in the interests of a speedy examination claims 1 and 14 now define the boundary between the upper and lower parts of the chip bin by using a level sensor, and states explicitly that the steam inlets in the upper part are above the level at which the level sensor operates. Basis for the level sensor is found in the level sensor 85 shown in Figure 2 and described in paragraph [0033]. There is no disclosure of

that feature in Prough, in which the level detector 26 is clearly above the uppermost steam nozzle 22. Prough has to position the steam nozzles several feet below the chip level, because Prough is using black liquor steam, which is highly corrosive. Injecting black liquor steam directly into the upper part of the chip bin, above the level of the chips, would result in corrosion of the chip bin. In Prough's system, the steam condenses before reaching the surface of the chip mass. It is believed that the present invention, as claimed in claims 1 and 14, is both new and non-obvious over Prough.

New claim 27 specifies that steam nozzles are present in the upper half of the chip bin. Basis for this feature is found in at least the orifices 46, 64, and 72 shown in Figure 2 and described in paragraphs [0027], [0029], and [0030]. There is no suggestion of this feature in any of the cited references. In Prough the first steam inlet 22 is so near the bottom that the examiner elsewhere alleges it directs steam along the bottom of the bin. In Johanson, as far as can be determined, the first steam inlet 26 in Fig. 3 is just below the middle of the bin. The various dimensions given by Johanson are measured down from the surface level 21 of the chip mass and not from the top of the bin. The only figure given for the surface level itself is 50% of the total bin height (see col. 5, line 50) with the top steam inlet probably about 10 to 15 feet below that (see col. 5, line 22 and Fig. 5). New claim 27 is believed to point out a relevant aspect of the present invention. In conventional chip bins such as Prough's (The applicant believes Johanson's steam injectors 26 have never been used in practice.) the steam injectors are near the bottom so that the steam rises through the resting chip mass. In the applicant's chip bin, the chips fall past the steam orifices, so it is desirable for the first steam orifices to be near the top, to maximize the height over which the steam is acting directly on the chips. It is therefore believed that the invention as claimed in claim 27 is also new and non-obvious over the cited references.

The present invention, as claimed in claims 9 and 22, provides a chip bin with steam orifices to supply steam to the upper part of the chip bin, and a temperature sensor in the lower part of the chip bin. The examiner argues that the original wording of claims 9 and 22 does not require a temperature sensor located in the lower part of the chip bin. The applicant does not agree with the examiner's interpretation, but in the interests of speedy examination the syntax of claims 9 and 22 has been adjusted. Claims 9 and 22 recite steam orifices in an upper part of the bin and a temperature sensor in the lower part of the bin, and

it is believed that the present invention, as claimed in claims 9 and 22, is both new and non-obvious over Prough.

The present invention, as claimed in claims 10 and 23, provides a chip bin with steam orifices positioned to direct steam downward along the surface of the tapered lower part of the bin. The examiner alleges that the conventional header 22 in Prough is a “downwardly angled pipe” and that Prough “discloses orifices angled downwards.” Prough does not disclose or suggest, and the examiner has not alleged that Prough discloses or suggests, “steam orifices positioned to direct steam ... along the surface of the tapered part” as required by claims 10 and 23. It is believed that the present invention, as claimed in claims 10 and 23, is both new and non-obvious over Prough.

Claims 2, 7-8, 11-12, 15, 19-21, 24-25, and 28 are dependent from various of the claims discussed above and, without prejudice to their individual merits, are believed to be allowable over Prough for the same reasons as their respective base claims.

In addition, however, claims 2 and 15 recite upwardly-angled steam orifices arranged in the upper part of the chip bin. The examiner refers to “upwardly angled pipe” 28 in Prough. The examiner acknowledges Prough’s pipe 28 is in the lower part of the bin. As previously explained, Prough’s pipe 28 is not an orifice; pipe 28 is the supply to the VibraBin.

Claims 7 and 20 are deemed allowable for the same reasons as claims 9 and 22.

Claims 11 and 24 recite increasing the steam flow downward along the tapered bottom part of the bin in response to a “lack of normal flow” of the chips. The examiner points out that in Prough “flow sensors and level controllers are disclosed. The controllers are interlocked with the steam application,” but the examiner makes no showing that Prough’s system has the specific capability required by claims 11 and 24.

With reference to claims 12 and 25, there is no suggestion in Prough of additional nozzles that are used only in response to a lack of normal flow of chips.

For these reasons also, claims 2, 11-12, 15, and 24-25 are believed to be novel and non-obvious over Prough.

**35 U.S.C. § 103:**

Claims 4-6 and 17-19 were rejected as obvious over Prough in view of Johanson. Without prejudice to their individual merits, these claims are believed to be allowable over the combination of Prough and Johanson for the same reasons as their respective base claims are believed to be allowable over Prough alone.

It is clear from the references to falling chips that claims 4-6 and 17-19 recite features in the upper part of the chip bin, above the level of the chip mass. In order to expedite the examination of this application, claims 4, 6, 17, and 19 have been amended to refer explicitly to the upper part of the chip bin. New claim 28, which corresponds generally to claim 6, refers explicitly to the upper half of the chip bin. The features in Johanson relied on by the examiner are all in the lower part of the bin, below the level 21 of the chip mass. There is nothing in the references that would have suggested to a person of ordinary skill in the art to provide the features recited by claims 4-6 and 17-19 in the upper part of the bin.

For these reasons also, it is believed that claims 4-6, 17-19, and 28 are novel and non-obvious over the combination of Prough and Johanson.

Claims 3 and 16 were rejected as obvious over Prough in view of U.S. Patent No. 3,661,328 (Leask). Leask is cited only as showing the additional feature of claims 3 and 16 and, without prejudice to their individual merits, these claims are deemed to be allowable over the combination of Prough and Leask for the same reasons as their respective base claims are deemed to be allowable over Prough alone.

In addition, Leask is cited as showing a "chip bin 10 into which steam is introduced tangentially from cyclone separator 44." This is not correct. Leask does not show introducing steam from the cyclone separator into the chip bin. The steam goes up the overflow pipe 45, see col. 3, lines 49-50, and only the fibers fall into the bin 10. That is what the cyclone separator is for. Nothing enters Leask's chip bin 10 tangentially. The fibers fall straight down from the apex of the separator 44 through the top of the chip bin 10. There is no suggestion in either Prough or Leask that introducing steam tangentially "would

improve the distribution of wood chips in the bin.” That suggestion is found only in the present application, applied with the benefit of impermissible hindsight.

Further, the structure 10 of Prough and the structure 10 of Leask, although each is called a “chip bin,” appear to be essentially different objects. In particular, the outlet feed mechanisms are totally different. Leask uses a horizontal screw feeder 11, Prough uses a Vibra-Bin discharge. Even if Leask provided a teaching of “improving the distribution of the wood chips in the bin,” that teaching would be irrelevant on its face to Prough’s different chip bin. It is therefore respectfully submitted that it would not have been obvious to look to Leask’s chip bin for improvements to the steam-treatment of chips in Prough’s chip bin. For these reasons also, claims 3 and 16 are deemed not to be obvious over Prough and Leask.


***Conclusion:***

In view of the foregoing, reconsideration of the examiner’s rejections and allowance of all of claims 1-12, 14-25, and 27-28 are earnestly solicited.

Respectfully submitted

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